

REMARKS

Introduction

Claims 4 and 8-10 are pending, of which claim 4 is independent.

Claim 4 has been amended to correct informalities in the claim language and to more clearly define the present subject matter. Care has been taken to avoid introducing new matter.

Patentability under 35 U.S.C. §112

Claims 4 and 8-10 were rejected under 35 U.S.C. § 112, first paragraph, as allegedly failing to comply with the written description requirement. Claims 4 and 8-10 were also rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite. Applicants respectfully submit the amendment made to claim 4 overcomes these rejections.

Patentability under 35 U.S.C. §103

Claims 4 and 10 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Maeda et al. (US 6,189,771) in view of Mei (US 6,680,128) and further in view of the collective teachings of Kodas (US 6,951,666) and Kang et al (US, 5,837,119). Claims 8 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Maeda in view of Mei and further in view of the collective teachings of Kodas and Kang, as applied to claim 4, and further in view of Taguchi et al. (US 2003/0121564). Claim 9 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Maeda in view of Mei, and further in view of the collective teachings of Kodas and Kang, as applied to claim 4, and further in view of Kawabata et al (JP 2003-264259).

Applicants respectfully submit that claim 4 would not have been obvious over the cited references because it would not have been obvious to combine the cited references as the

Examiner asserted.

The Examiner asserted, in rejecting claim 4, that Mei discloses solder paste where a particular solder composition includes tin and zinc coated with silver. Applicants submit that the solder composition of Mei is in fact “solder” and is to be “melted” thereby soldering electrodes. In other words, the solder composition of Mei exhibits electrical conductivity between the electrodes when it is melted and solidified. Similarly, Maeda discloses melting and solidifying the solder to electrically connect electrodes.

The Examiner further asserted that Kang and Kodas disclose the use of flake-like shaped metal powder. Applicants submit, however, that the flake-like shaped powder of Kodas (e.g., Cu) is utilized for obtaining high conductivity (see, abstract). Specifically, Cu (see, col. 4, lines 54-55) is a high-melting point metal and dominates the conductivity, and thus the alleged flake-like shaped metal powder does not melt but should keep its flake-like shape. Similarly, in Kang, as shown in FIG. 3, flake-like shaped metal filler is utilized for better electrical conductivity (see, col. 5, lines 37-40) without the filler being melted.

In summary, Applicants submit that Maeda and Mei are directed to “solder” which is melted and solidified to obtain electrical conductivity, while Kodas and Kang are directed the metal particles or the filler which remain un-melted to obtain electrical conductivity. As such, one of ordinary skill in the art who was reviewing Mei and Kodas/Kang would not have been motivated to combine Kodas/Kang with Mei because the requirements and properties of the metal powder are different between Mei and Kodas/Kang. Thus, claim 4 would not have been obvious over the cited references.

Further, Applicants respectfully submit that the claimed range of metal powder (1-20

vol%) would not have been obvious. The Examiner asserted that Mei discloses that the solder component is mixed with flux by 50 vol%. The Examiner concluded that since the amount disclosed by Mei is a typical amount and the solder component affects the viscosity, ease of deposition, slumping, etc, it would have been obvious to modify Mei's amount of particle to arrive at the claimed range.

However, as set forth above, Mei is directed to "solder" itself, which requires high conductivity when melted and solidified. Accordingly, Mei discloses that high concentrations of "solder" powder are desirable (see, col. 4, line 67 to col. 5, line 5) to provide high electrical conductivity. As such, even if the amount of 50% is typical in Mei, one of ordinary skill in the art who was reviewing Mei would not have been motivated to reduce the amount of the solder powder from 50 vol% to 1-20 vol%, which is less than a half of 50 vol%. If, *arguendo*, the amount of the solder powder in Mei were reduced to 20 vol% or less, the electrical conductivity of Mei's solder paste would be poor and such a solder paste would not function as intended (see, MPEP § 2143.01 and § 2145). Thus, at a minimum, there is no reasonable expectation of success in reducing the amount of solder powder of Mei to the claimed range (MPEP § 2143.02). As such, Applicants submit that the claimed range of metal particle is not obvious over Mei. Thus, claim 4 would not have been obvious over the cited references.

Based on the foregoing, Applicants respectfully submit that claim 4 and all claims dependent thereon are patentable over the cited references. Thus, it is requested that the Examiner withdraw the rejection of claims 4 and 8-10 under 35 U.S.C. § 103.

Conclusion

Having fully responded to all matters raised in the Office Action, Applicants submit that all claims are in condition for allowance, an indication for which is respectfully solicited. If there are any outstanding issues that might be resolved by an interview or an Examiner's amendment, the Examiner is requested to call Applicants' attorney at the telephone number shown below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

McDERMOTT WILL & EMERY LLP



Takashi Saito
Limited Recognition No. L0123

600 13th Street, N.W.
Washington, DC 20005-3096
Phone: 202.756.8000 TS:lcb
Facsimile: 202.756.8087
Date: April 29, 2011

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as our correspondence address.**